Operational Mosquito Control in Response to West Nile Virus

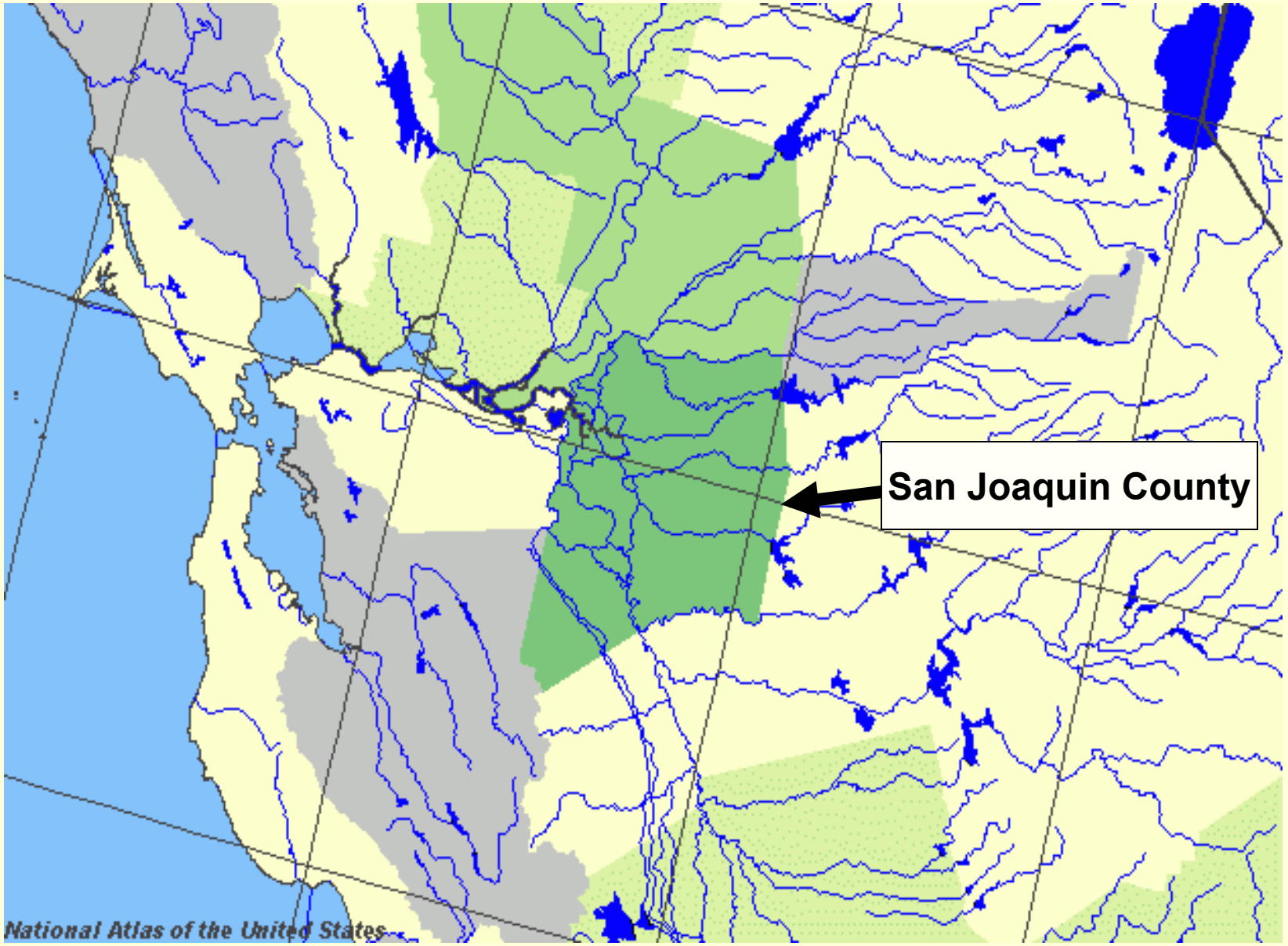
John Stroh

San Joaquin County

Mosquito & Vector Control District

"If we expect that something bad is going to happen, we behave very differently than if we expect something good could happen."

Steve Carpenter, Ecologist, University of Wisconsin


San Joaquin County
National Atlas of the United States

CALIFORNIA MOSQUITO-BORNE VIRUS SURVEILLANCE & RESPONSE PLAN

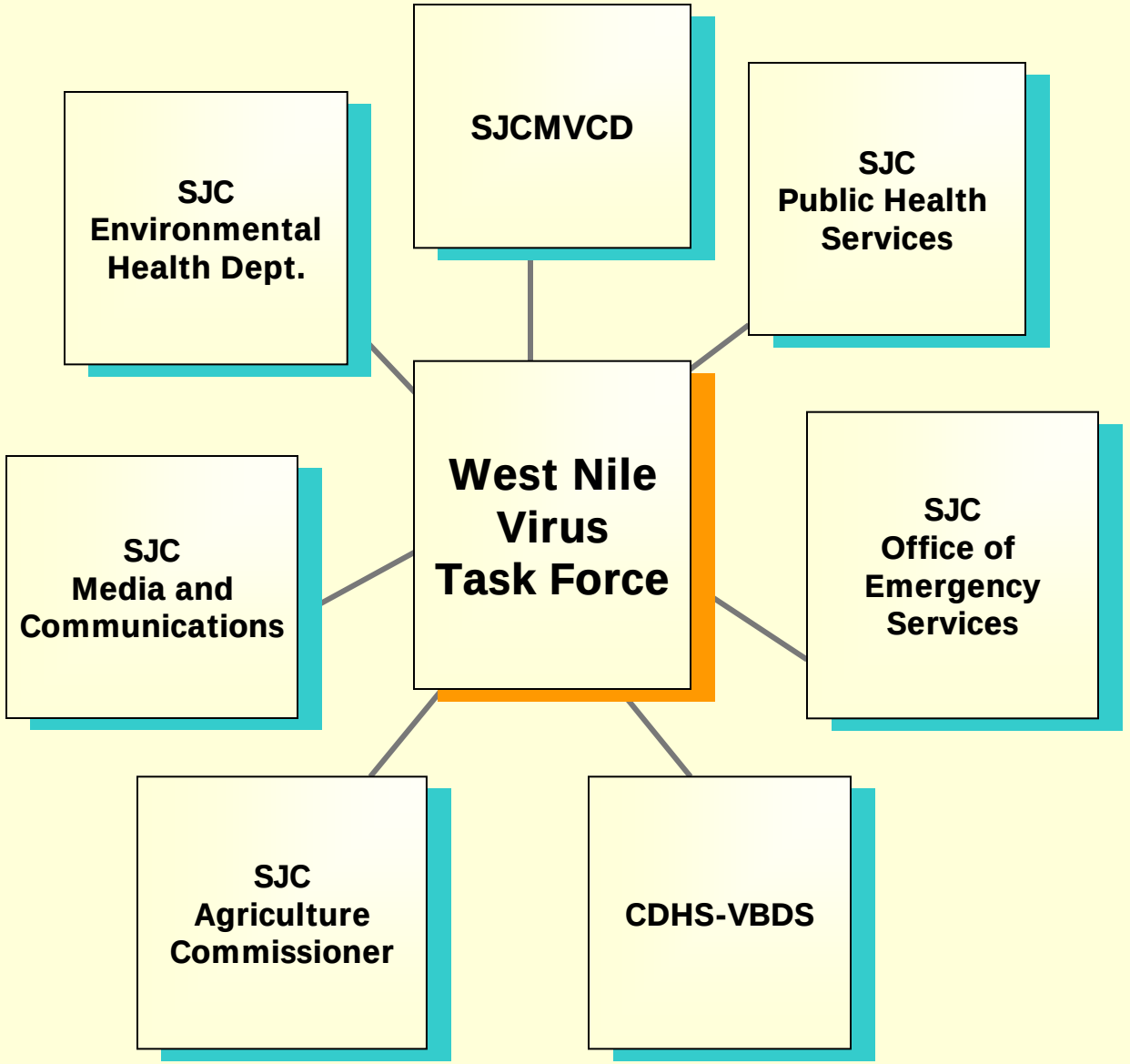
Arnold Schwarzenegger, Governor

California Department of Health Services
Mosquito & Vector Control Association of California
University of California

June 2005

For further information contact:
Vector-Borne Disease Section
California Department of Health Services
(916) 552-9730
http://westnile.ca.gov

WNV Surveillance Factor	Assessment Value	Benchmark	Assigned Value
1. **Environmental Conditions.** Rural transmission may favor El Niño conditions, whereas urban transmission may favor La Niña conditions. Temperature data link: http://www.ipm.ucdavis.edu/WEATHER/wxretrieve.html	1	Avg daily temperature during preceding month <56° F	
	2	Avg daily temperature during preceding month 57-65° F	
	3	Avg daily temperature during preceding month 66-74° F	
	4	Avg daily temperature during preceding month 75-83° F	
	5	Avg daily temperature during preceding month >83° F	
2. **Adult *Culex tarsalis* and *Cx. pipiens complex* abundance** Determined by trapping adults, identifying them to species, and comparing numbers to those previously documented for an area for current time period.	1	Vector abundance well below average (<50%)	
	2	Vector abundance below average (50-90%)	
	3	Vector abundance average (90-150%)	
	4	Vector abundance above average (150-300%)	
	5	Vector abundance well above average (>300%)	
3. **Virus infection rate in *Culex tarsalis* and *Cx. pipiens* complex mosquitoes** Tested in pools of 50. Test results expressed as minimum infection rate (MIR) per 1,000 female mosquitoes tested (or per 20 pools).	1	MIR / 1000 = 0	
	2	MIR / 1000 = 0-1.0	
	3	MIR / 1000 = 1.1-2.0	
	4	MIR / 1000 = 2.1-5.0	
	5	MIR / 1000 > 5.0	
4. **Sentinel chicken seroconversion** Number of chickens in a flock that develop antibodies to WNV. If more than one flock is present in a region, number of flocks with seropositive chickens is an additional consideration. Typically 10 chickens per flock.	1	No seroconversions	
	2	One seroconversion in single flock over broad region	
	3	One to two seroconversions in a single flock in specific region	
	4	More than two seroconversions in single flock or one to two seroconversions in multiple flocks in specific region	
	5	More than two seroconversions per flock in multiple flocks in specific region	
5. **Dead bird infection** Includes zoo collections.	1	No WNV positive dead birds	
	2	One WNV positive dead bird in broad region	
	3	One WNV positive dead bird in specific region	
	4	Two to five WNV positive dead birds in specific region	
	5	More than five WNV positive dead birds and multiple reports of dead birds in specific region	
6. **Equine cases**	1	No equine cases	
	3	One equine case in broad region	
	4	One or two equine cases in specific region	
	5	More than two equine cases in specific region	
7. **Human cases**	1	No human cases	
	3	One human case in broad region	
	4	One human case in specific region	
	5	More than one human case in specific region	
8. **Proximity to urban or suburban regions** (score only if virus activity detected) Risk of outbreak is highest in urban areas because of high likelihood of contact between humans and vectors.	1	Virus detected in remote area	
	2	Virus detected in rural areas	
	3	Virus detected in small towns	
	4	Virus detected in suburban areas	
	5	Virus detected in urban area	
Response Level / Average Rating: Normal Season (1.0 to 2.5) Emergency Planning (2.6 to 4.0) Epidemic (4.1 to 5.0)		**TOTAL**	
		AVERAGE	


SJCMVCD
SJC
Environmental
Health Dept.
SJC
Public Health
Services
West Nile
Virus
Task Force
SJC
Media and
Communications
SJC
Office of
Emergency
Services
SJC
Agriculture
Commissioner
CDHS-VBDS

WNV Risk Assessment - 2005

DATE	AVG. RATING	RESPONSE
July 22	2.15	Normal Season
July 29	3.375	Emergency Planning
August 1	3.625	Emergency Planning
August 8	4.0*	Emergency Planning
August 15	4.375	Epidemic Conditions

First's

First WNV+ Dead Bird	First WNV+ Mosquito Pool	First WNV+ Human	First WNV+ Equine	First WNV+ Sentinel Chicken
6/7/05 **Date of collection** **Week** **23**	7/5/05 **Date of collection** **Week** **27**	7/15/05 **Date of onset** **Week** **28**	7/23/05 **Date of onset** **Week** **29**	7/25/05 **Date of collection** **Week** **30**

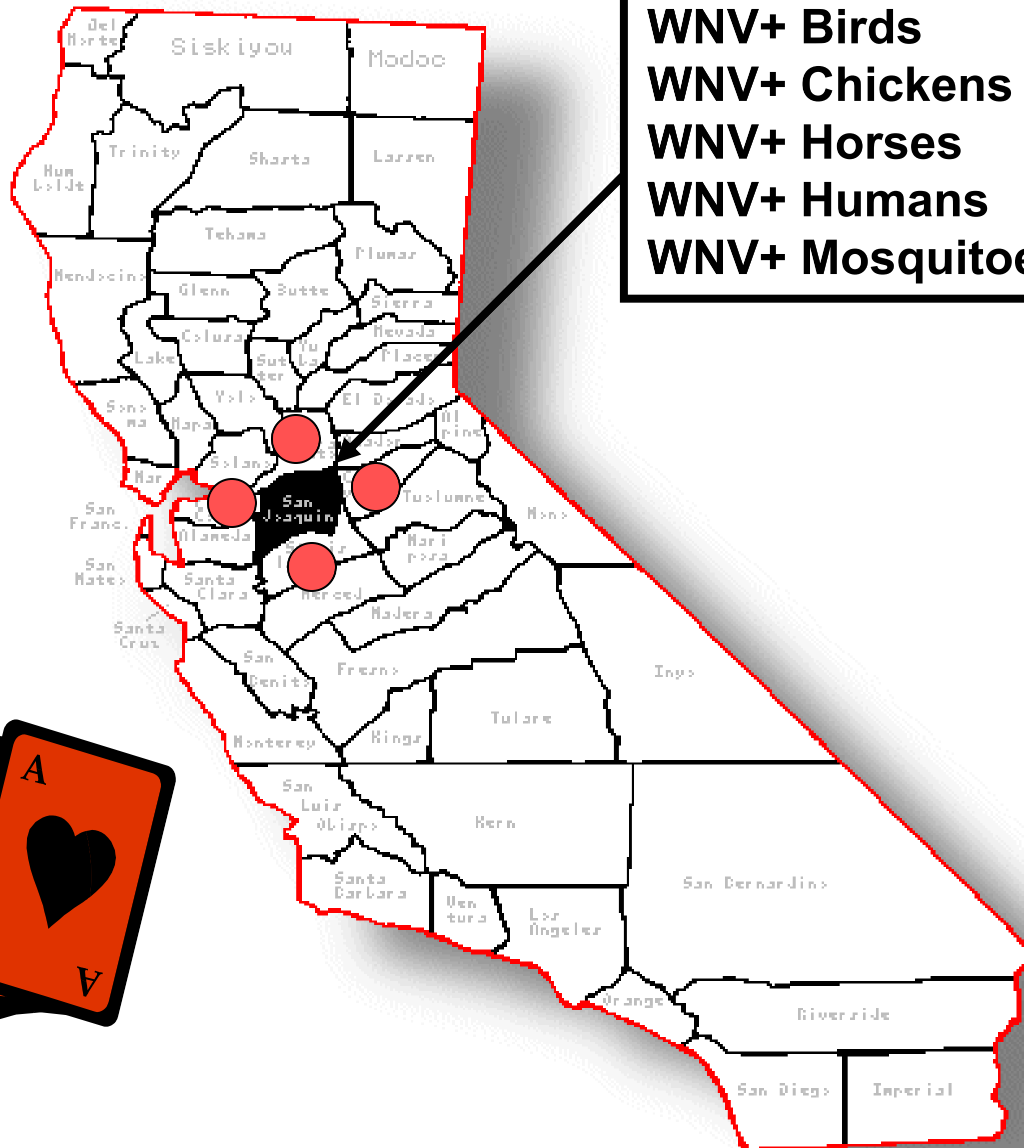
July 22 - August 6, 2005

- Increased surveillance for WNV in mosquito pools and follow-up on equine, human, and dead bird reports
- Increased emphasis on inspection and larviciding at known and suspect mosquito breeding sites
- Increased adulticiding in areas with vector species and/or West Nile virus
- Increased education and outreach per recommendations of SJC WNV Task Force

August 7-15, 2005

- Analysis of surveillance data and WNV activity in SJC
- Analysis of WNV activity and control operations in surrounding counties and districts
- Developed budget to expand surveillance, control, and education/outreach for consideration by BOT
- Increased communications with SJC WNV Task Force and SJCMVCD staff

WNV+ Birds
WNV+ Chickens
WNV+ Horses
WNV+ Humans
WNV+ Mosquitoes



August 15, 2005

August 16, 2005
Board of Trustees Meeting

- Status report re: WNV activity and mosquito control operations in SJC and surround counties and districts
- Proposed budget to expand surveillance, control, and education/outreach
- Board action to allocate additional $2.5M per staff recommendations

Increased adulticiding in response to increased WNV activity

1. Selection of large-scale aerial spray company to assist current aerial contractor
2. Public notification and updates
3. Expanded adult mosquito surveillance

Information on Increased Mosquito Spraying

- Direct mailing to ≈245,000 parcels; included information on telephone numbers and website address
  - SJC-OES - (209) 469-8200 or www.sjgov.org/oes
  - SJCMVCD – (209) 982-4675
- Full page advertisements/notices in local newspapers (total circulation of 136,200), weeks of 8/22, 8/29, and 9/5:
  - Lodi News Sentinel
  - The Record (Stockton)
  - Manteca Bulletin
  - Tracy Press

El Condado de San Joaquin Fuerza Operativa del Virus del Nilo

Protéjase Contra el Virus del Nilo...

¡Evite Picaduras de Zancudos!

- ❑ Apliquese repelente para zancudos que contenga DEET (N, N-diethyl-meta-toluamide) a partes de la piel que esten expuestas, cuando ande afuera.

- ❑ Cuando sea posible use camisas o blusas de manga larga, pantalones largos y calcetines cuando ande afuera.
- ❑ Las horas cuando esta oscureciendo, son las horas maximas cuando pican los zancudos. Considere evitar actividades de afuera durante estas horas o tome precauciones usando repelente para zancudos y ropa que le protéja durante las horas de oscuridad o horas del amanecer.
- ❑ Limite alrededor de su casa la cantidad de lugares en donde los zancudos se reproducen, deshágase de los objetos que acumulan agua, en ellos los zancudos podrian reproducirse.
- ❑ Reporte cualquier plaga o infestación de zancudos al Distrito de Control de Zancudos.

El Condado de San Joaquin Fuerza Operata del Virus del Nilo

- Linea de Información al público: (209) 469-8200
- San Joaquin County Mosquito and Vector Control District: (209) 982-4675 or 1-800-300-4675
- San Joaquin County Public Health Services: (209) 468-3822
- San Joaquin County Environmental Health Dept.: (209) 468-3420
- San Joaquin County Agricultural Commissioner's Office: (209) 468-3300
- San Joaquin County Office of Emergency Services: (209) 468-3962

Web Sites:

- www.co.san-joaquin.ca.us/oes
- www.westnile.ca.gov
- www.cdc.gov

Selection of an additional aerial spray contractor

- Evaluation of recent activities in Sacramento-Yolo MVCD
- Evaluation of available contractors (Dynamic Aviation and VDCI)
- Evaluation of the compatibility with existing aerial spray contractor

Selection of material

- Safety, cost, label requirements, effectiveness (resistance), and compatibility with operations
- Public relations/ media and use by neighboring districts

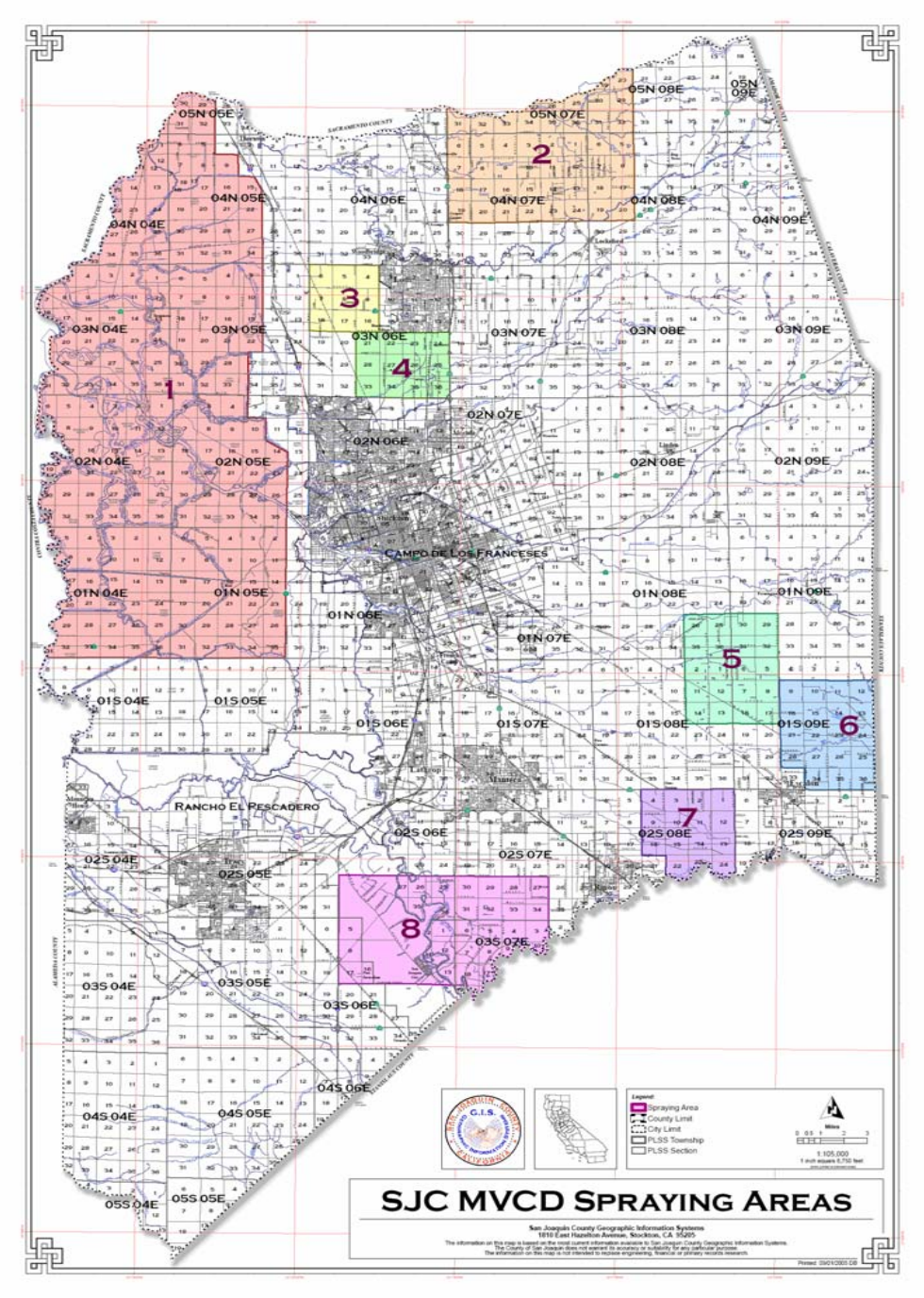
Establish Spray Areas

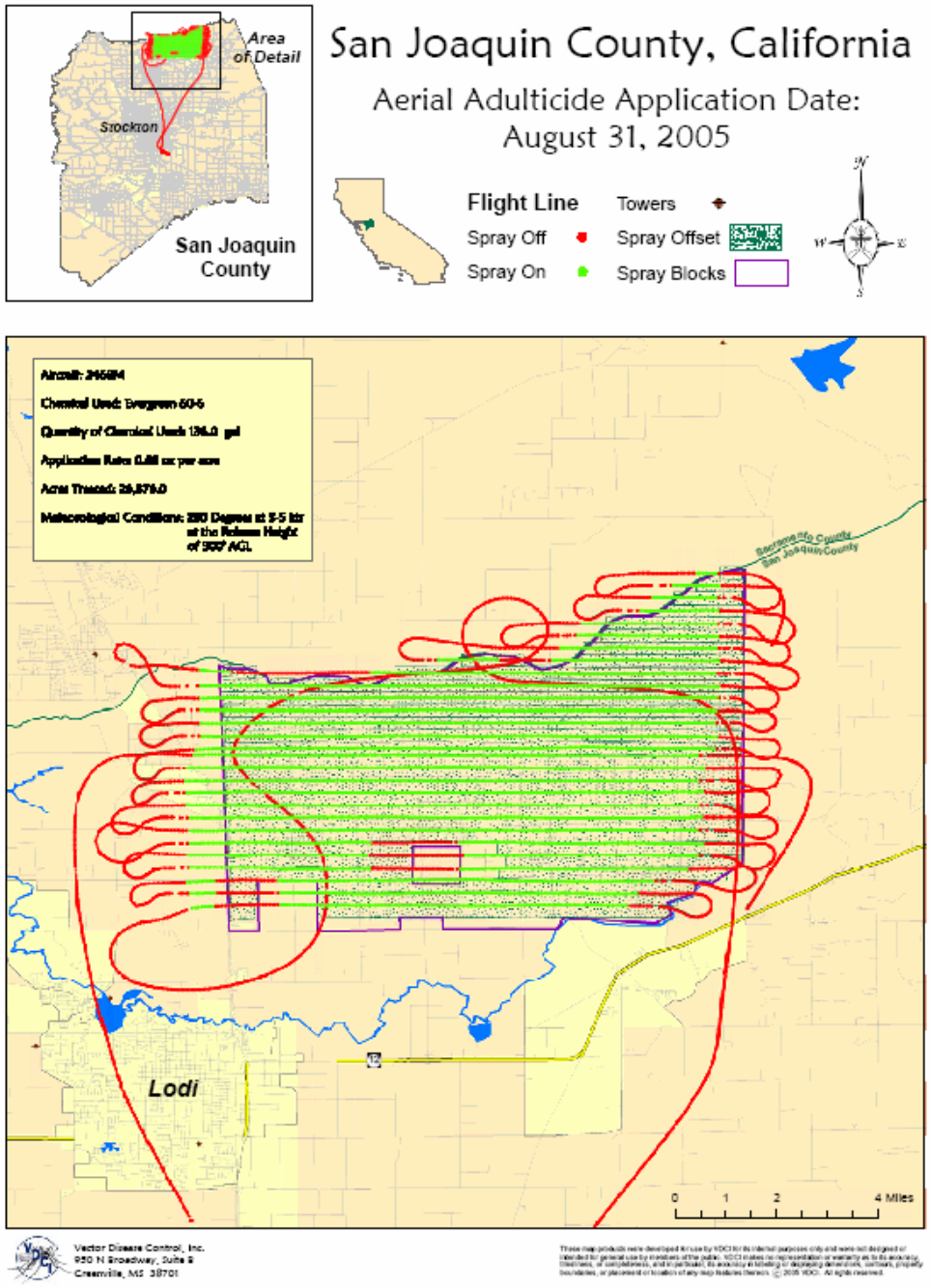
- Identification of large (≥5,000 acres) areas with vector mosquito populations and/or WNV at or above action thresholds

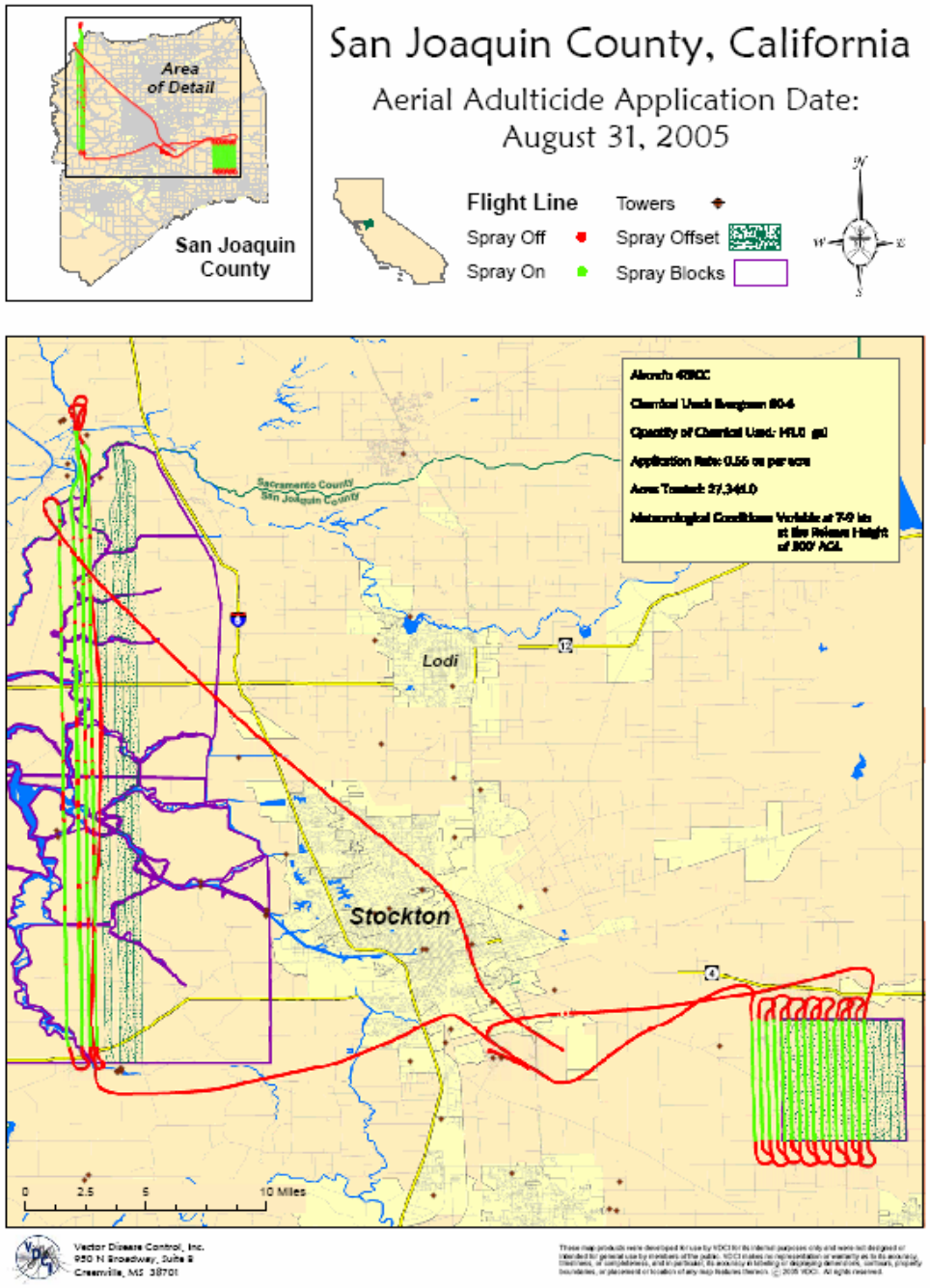
- Maintain existing mosquito control operations in 19 control zones (1,445 sq. mi.)
  - **≈5,000 routine sources inspected/treated by ground crews**
  - **Routine larviciding by air of rice fields and large agriculture and industrial sources**
  - **Routine ULV adulticiding by ground crews of small (≤5,000 acres) areas with vector species and WNV at or above treatment thresholds**

INITIAL SPRAY PROJECT

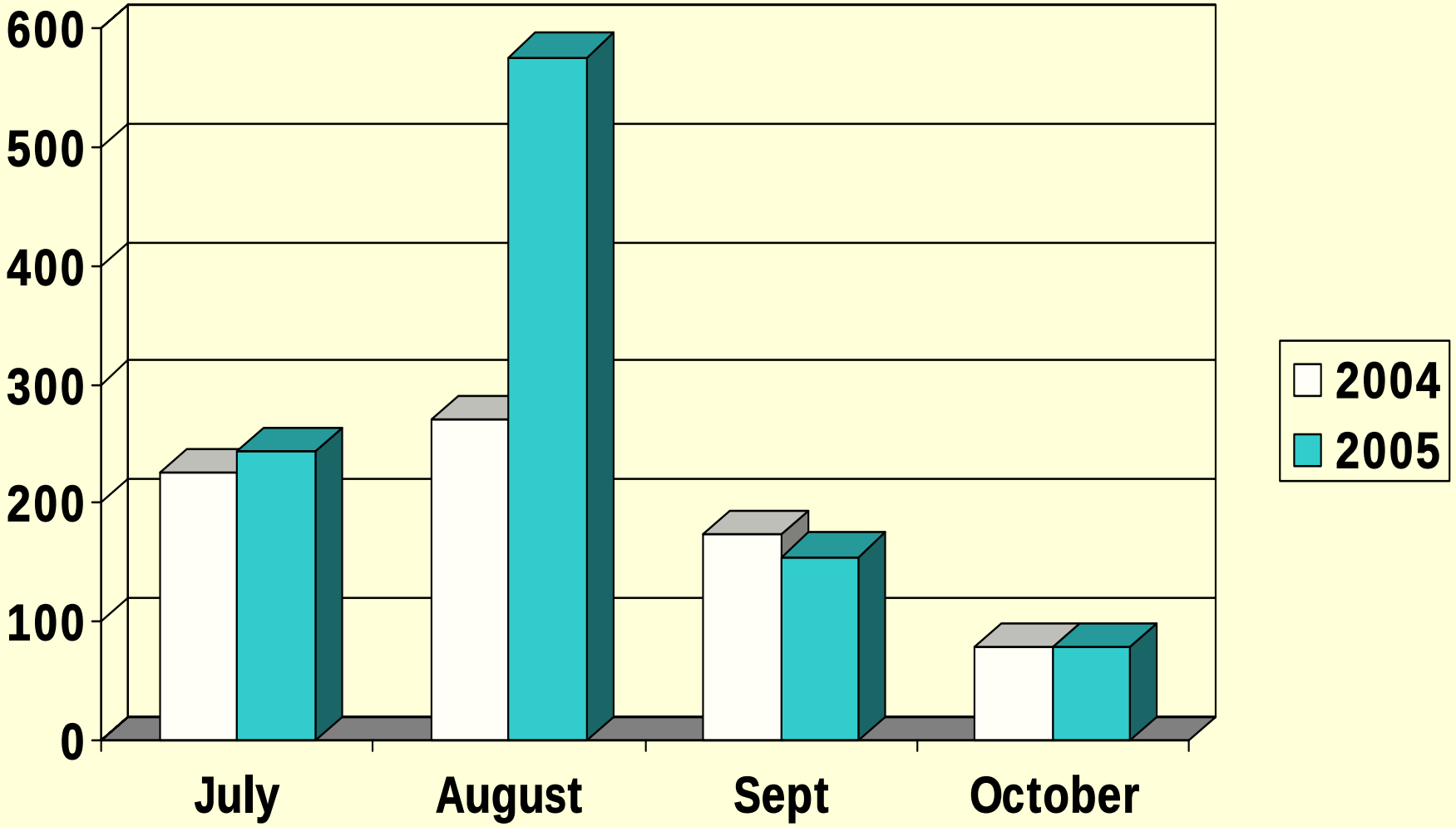
1)	119,979 acres	618.8 gals
2)	26,445 acres	134.6 gals
3)	5,760 acres	29.7 gals
4)	7,680 acres	39.6 gals
5)	12,847 acres	66.2 gals
6)	12,385 acres	63.9 gals
7)	9,120 acres	47 gals
8)	25,824 acres	133.2 gals
	220,040 acres	1,133 gallons
X 3 =	660,120 acres	3,399 gallons



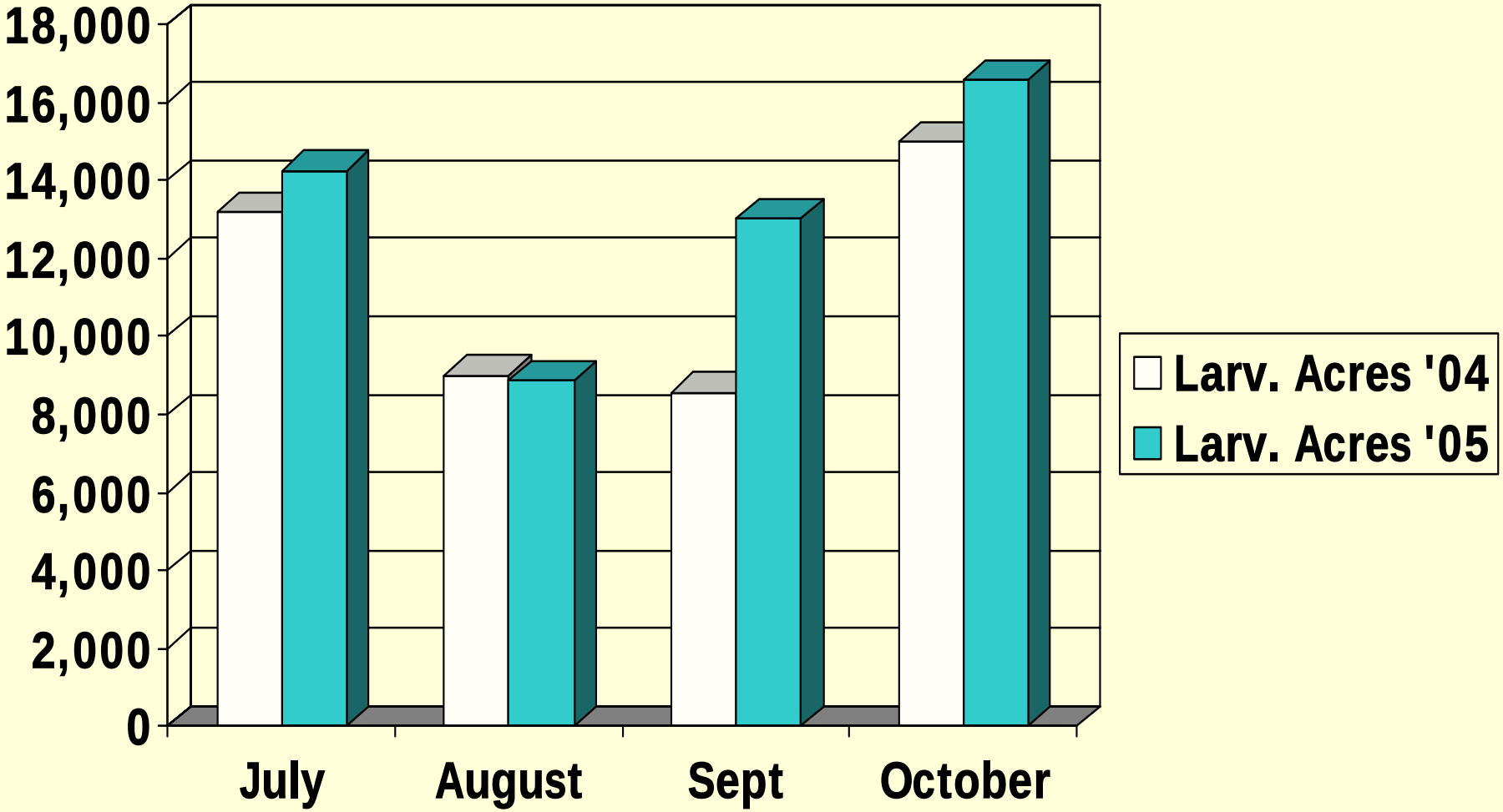

Area of Detail
Stockton
San Joaquin County
San Joaquin County, California
Aerial Adulticide Application Date:
August 31, 2005
Flight Line
Towers
Spray Off
Spray Offset
Spray On
Spray Blocks
N
W
E
S
Aircraft: 24684
Chemical Used: Evergreen 60-6
Quantity of Chemical Used: 136.0 gal
Application Rate: 0.88 oz per acre
Acres Treated: 26,875.0
Meteorological Conditions: 280 Degrees at 3-5 kts at the Release Height of 350' AGL
Sacramento County
San Joaquin County
Lodi
0
1
2
4 Miles
Vector Disease Control, Inc.
950 N Broadway, Suite 9
Greenville, MS 38701


Area of Detail
San Joaquin County
San Joaquin County, California
Aerial Adulticide Application Date:
August 31, 2005
Flight Line
Towers
Spray Off
Spray Offset
Spray On
Spray Blocks
Aircraft: 43CC
Chemical Used: Evergreen 60-6
Quantity of Chemical Used: 141.0 gal
Application Rate: 0.55 oz per acre
Acres Treated: 27,340.0
Meteorological Conditions Variable at 7-9 kts at the Release Height of 300' AGL
Sacramento County
San Joaquin County
Lodi
Stockton
0
2.5
5
10 Miles
Vector Disease Control, Inc.
950 N Broadway, Suite 8
Greenville, MS 38701

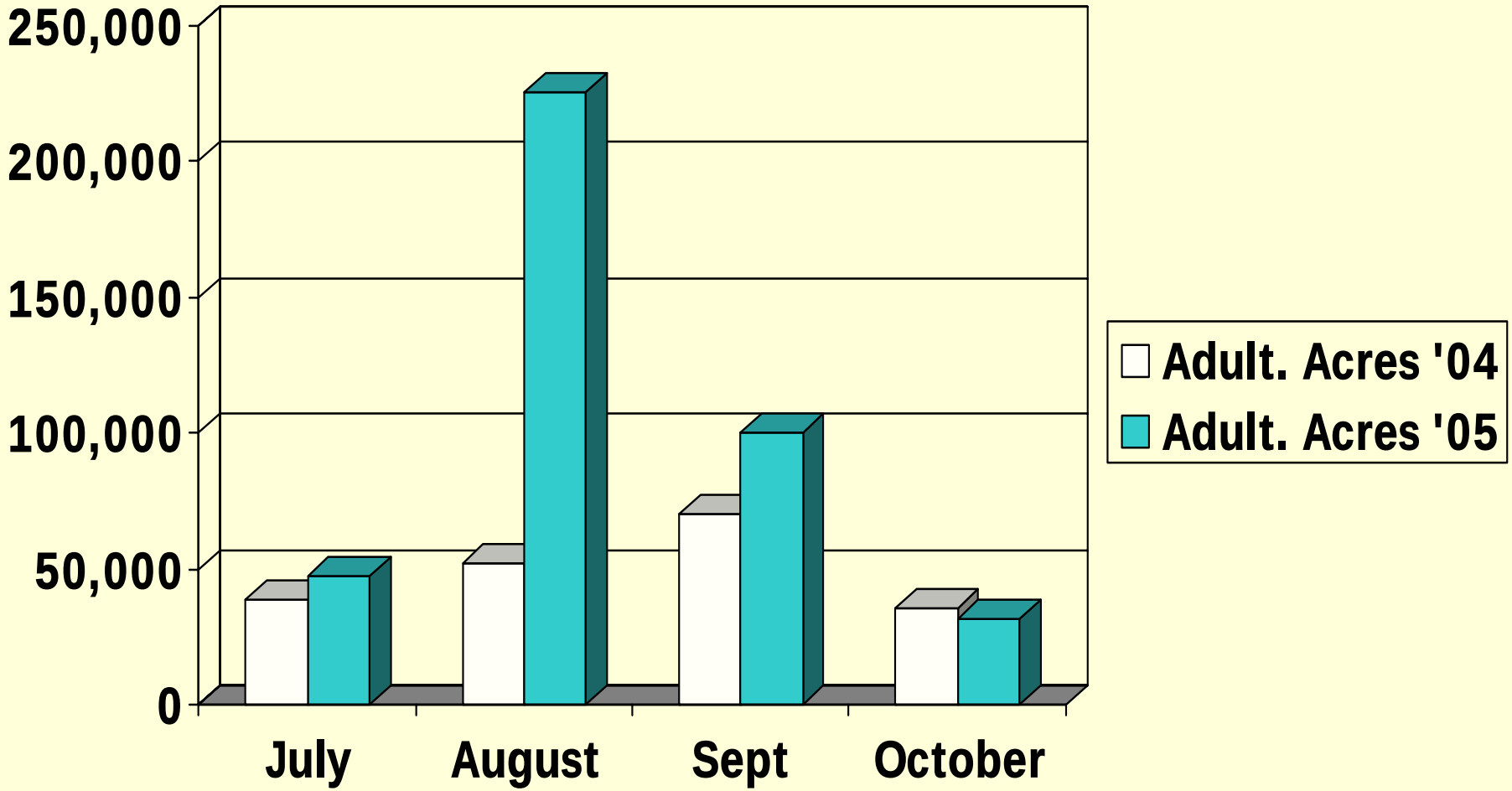
Mosquito Control Spray Operations Service Requests



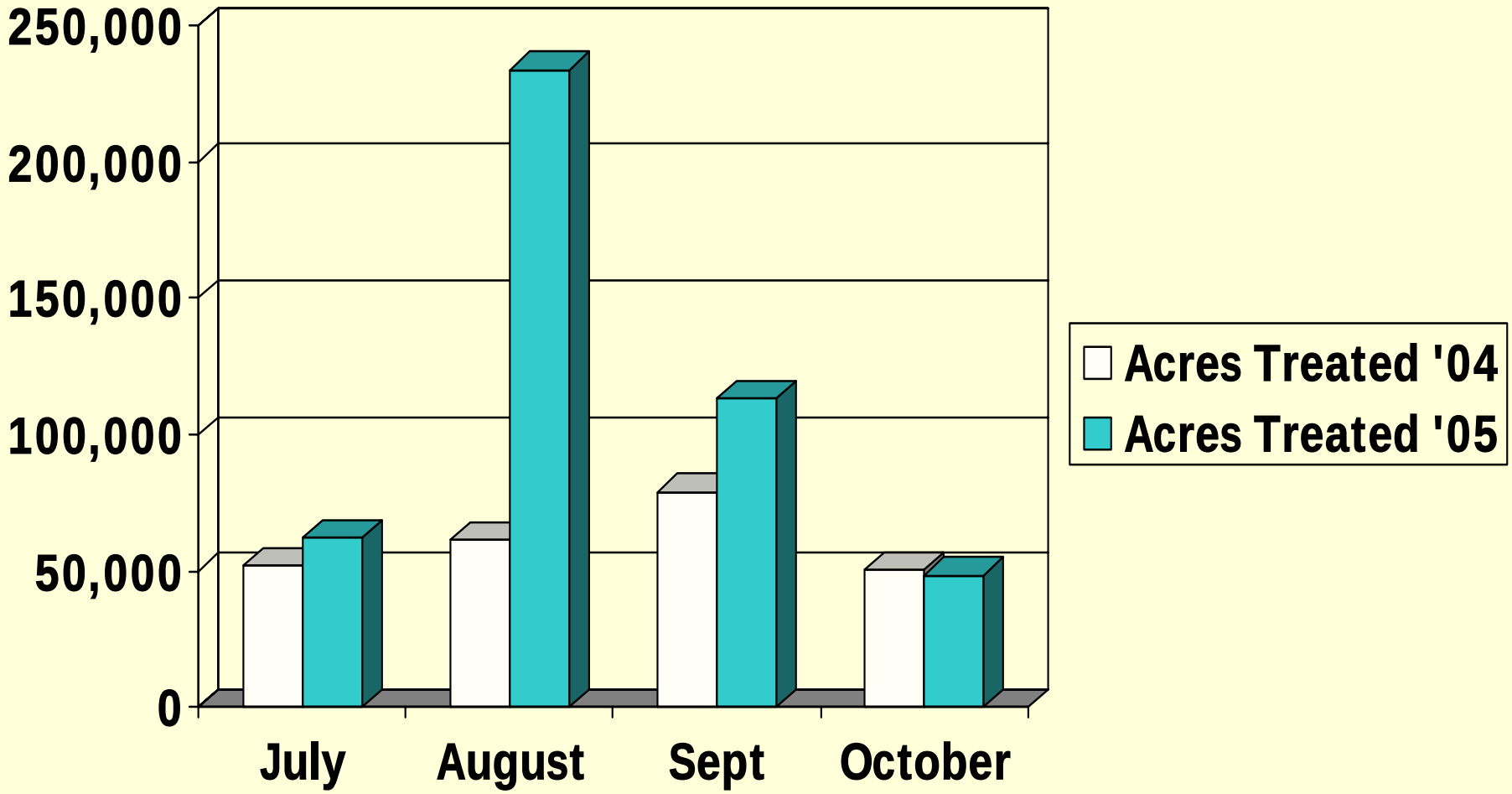
Mosquito Control Spray Operations
Larviciding



Mosquito Control Spray Operations
Adulticiding



Mosquito Control Spray Operations



What Worked

- California Mosquito-Borne Virus Surveillance and Response Plan
- San Joaquin County West Nile Virus Task Force
- Expanded education and outreach
- Expanded surveillance and testing
- Emphasis on larviciding and mosquito source elimination
- 2005-06 State budget w/WNV augmentation

What Didn't Work

- VDCI could not provide for early A.M. spraying when P.M. spraying was cancelled
- Media overlap with Sacramento, Stanislaus, and Bay-area counties created confusion for local (SJC) residents
- Changing our dead bird program mid-season created confusion and poor public relations
- Sentinel chickens did not serve as an early indicator
- Even with year-round education and expanded press since 2002 there was public perception that District was initiating control in 2005 for WNV
- Low potential for mutual aid agreements (either providing or receiving assistance)

"Crime is an epidemic. Poverty is an epidemic. Congressional lobbying for special interest groups is an epidemic. West Nile virus isn't. It's a media-hyped problem that Stocktonians accept as truth."

Rene Reyes, The Record, 9-9-05